ER Site No. 228: Centrifuge Dump Site (East of TA-II)

ADS: 1309
Operable Unit: Tijeras Arroyo

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Site History

The Centrifuge Dump Site consists of a pair of inactive dump sites (SWMU 228A and SWMU 228B) that are located along the northern rim of the Tijeras Arroyo between Technical Area-II (TA-II) and Powerline Road. From 1951 through 1956, weapon debris including Depleted Uranium (DU) fragments from SWMU 50 (the Centrifuge Test Site) was dumped at SWMU 228A. Beginning in 1952 and ending in 1965, construction debris from the demolition of Kirtland Air Force Base (KAFB) housing was dumped at both sites. At SWMU 228A, the majority of the weapon debris remained covered by soil and concrete slabs until heavy rainfall in July 1997 caused significant soil erosion. As a result, some of the weapon debris washed out of the gully; the southern site boundary was subsequently adjusted about 250 ft farther south. At present, SWMU 228A covers 1.6 acres. SWMU 228B is much larger and covers 6.6 acres. During 1998 to 2000, both sites were remediated. SWMU 228A was remediated as a Voluntary Corrective Measure (VCM). SWMU 228B was remediated as a Housekeeping activity.

Across the two sites, the depth to groundwater varies from about 280 to 350 ft, bgs. Only after significant rainfall does surface water flow at either site or in Tijeras Arroyo. However, neither site is located on the 100-year floodplain of Tijeras Arroyo.

Constituents of Concern

The COCs for SWMU 228A were DU, Resource Conservation and Recovery Act (RCRA) metals, High Explosives (HE), Volatile Organic Compounds (VOC)s, and Semi-Volatile Organic Compounds (SVOC)s. The sole COC for SWMU 228B was friable asbestos.

Current Hazards

No chemical or radioactive hazards are present at ER Site 228.

Current Status of Work

The Centrifuge Dump Site was not identified in the Comprehensive Environmental Assessment and Response Program (CEARP) or RCRA Facility Assessment (RFA). The activities discussed below were conducted by the ER Project.

SWMU 228A

Before being remediated during a VCM in 1998-1999, SWMU 228A was investigated using a variety of techniques. In 1994, a unexploded ordnance (UXO)/HE inspection, gamma-radiation survey, and aerial-photography investigation were completed. No UXO/HE material was identified. However, two radioactive anomalies were identified and partially excavated from the SWMU 228A gully. Twelve drums of DU-contaminated soil and one drum of DU fragments/metallic debris were shipped off-site. Except for the area surrounding the gully, no other disposal areas were identified in the aerial photography.

Prior to the VCM, 306 soil samples were collected during eight phases of sampling. The samples were analyzed for RCRA and Target Analyte List (TAL) metals, VOCs, SVOCs, Polychlorinated Biphenyl (PCB)s, pesticides, herbicides, HE compounds, and radionuclides such as uranium, plutonium, and tritium. Six soil-vapor samples also were collected. The analytical results suggested that only DU and RCRA metals were a concern. Following the July 1997 erosion event, planning for the VCM was conducted. A document search was subsequently conducted at the SNL/NM Technical Library in 1998. Test operations for the centrifuge were found to be well-documented and were useful for verifying the COCs. Geophysical and radiological surveys to locate buried debris were conducted in early 1998. Numerous metallic and DU anomalies were identified across about one acre of the site.

The VCM activities at SWMU 228A began in July 1998 and involved about 12 months of field work. About 1,800 cubic yards of soil, cobbles, and debris were excavated. After being mechanically sieved with a field grizzly, approximately 1,400 cubic yards of DU-contaminated soil was scanned by the automated Segmented Gate System (SGS), which was operated by Thermo NUtech, Inc. About five cubic yards of DU fragments and DU-contaminated soil were segregated and containerized for off-site disposal. The remaining 'cold' soil was used to regrade the center portion of the site. The weapon debris consisted of electrical components, aluminum brackets, rubber pads, parachute material, lead pieces, fiberglass, and DU fragments. All of the debris was shipped to off-site waste disposal facilities.

Following the conclusion of the VCM excavation work, a final round of geophysical and radiological surveys was conducted across SWMU 228A. No anomalies were found. Subsequently, confirmatory soil samples were collected at 130 locations across the site. The samples were analyzed for DU, RCRA metals, uranium, HE, VOCs, SVOCs, and gamma-emitting radionuclides.

Both human-health and ecological risk-screening assessments were calculated for SWMU 228A using the analytical results from the VCM confirmatory soil samples. No significant human-health risks or ecological risks were identified. The remaining low level of radiological COCs resulted in the site being eligible for unrestricted radiological release. The risk assessments were incorporated in the SWMU 228A NFA proposal, which was submitted to New Mexico Environment Department(NMED) in September 1999.

The potential for surface-water erosion was minimized following the VCM activities at SWMU 228A. In July 1999, a final round of grading was conducted in order to divert surface water away from the steeper slopes. A total of three acres including the site and surrounding area was re-seeded with drought-tolerant native grasses. Two and a half of those acres were re-seeded with a seed drill. The additional one-half acre of steep slopes was hydro-seeded and then covered with erosion-control mats. Cobbles were used to line a shallow drainage ditch on the east side of the site.

In March 2000, NMED approved the NFA proposal for SWMU 228A by stating that the site was suitable for NFA petition. This site was approved for removal from SNL's Hazardous and Solid Waste Act (HSWA) permit in October 2000.

SWMU 228B

Unlike SWMU 228A, SWMU 228B did not contain hazardous or radioactive debris. The debris at SWMU 228B consisted solely of construction-demolition debris. SWMU 228B was, however, investigated using many of the same techniques. In 1994, a UXO/HE inspection, gamma-radiation survey, and aerial-photography investigation were completed. No UXO/HE material was found. During the radiation survey, a single radioactive anomaly was found and removed. The anomaly was a household electrical part. During a geophysical survey conducted in 1995, several magnetic anomalies were identified.

The aerial-photography investigation documented that hundreds of truck loads of construction-demolition debris were dumped at the site from 1952 to 1965. In 1972, the northeast part of the site was leveled during the construction of a water line and overhead powerlines. For the next 20 years, virtually no activity occurred at SWMU 228B except for the realignment of Powerline Road across the northern part of the site. In 1992, a storm-water ditch for the Explosive Components Facility was dug along the western part of SWMU 228B.

The installation of various underground utilities by KAFB in 1997 and 1998 provided a useful series of exploratory trenches across the northeastern end of SWMU 228B. The utilities included a waterline, a natural-gas line, and a fiber-optic cable. The trenches ranged in depth from three- to eight-ft and extended for over 2,800 ft along the northern and eastern sides of the site. Even though no buried debris was found in the trenches, the trenches were surveyed for radioactive materials. No elevated radiation was detected. Subsequently, the site boundary was revised to more accurately reflect the actual locations of construction-demolition debris.

In early 1998, geophysical and radiological surveys were again conducted to supplement the surveys done in 1994 and 1995. Numerous magnetic anomalies were identified across SWMU 228B, but no radioactive anomalies were detected.

In 1998, samples for asbestos analyses were collected from construction-demolition debris consisting of floor tiles, roofing, hardened adhesives, and various types of insulation. Only one type of debris, a grayish adhesive, contained friable asbestos. This asbestos covered a small 3,200-square feet area which came to be known as the friable-asbestos cleanup area. In February 1999, about 30 cubic yards of the adhesive and adjacent soil were excavated by hand, containerized, and shipped off-site to waste-disposal facility.

SWMU 228B was remediated during two phases of Housekeeping activities. During March through September 1999, approximately 4.3 acres of SWMU 228B was cleared of construction-demolition debris. As much as practical, soil was removed from the debris using a field grizzly. During January through March 2000, the remaining 2.3 acres was cleared of debris. Soil was removed from this debris with a motorized screen plant. Confirmatory geophysical surveys were conducted in September 1999 and March 2000; no magnetic anomalies remained at the site. The surveys confirmed that the construction-demolition debris had been spread across the site in a layer ranging from about one to five ft thick. All of the debris, along with an approximately one-ft layer of underlying native soil, was scraped up. The total cleared area was 6.6 acres.

The potential for surface-water erosion was minimized during the Housekeeping activities at SWMU 228B. Surface-water controls such as site grading, straw bales, erosion-control mats, and re-seeding were used. In November 1999, a small ditch at the southern end of SWMU 228B was truncated with a 40-ft long row of straw bales. In January 2000, a 500-ft long row of straw bales was installed along eastern side of the site where the slope exceeded 20 degrees. In March 2000, a final round of grading was conducted to direct surface water away from the steeper parts of the site. Revegetation work was performed in May 2000 using drought-tolerant native grasses. All of the site plus some of the surrounding area for a total of 11.8 acres was re-seeded. A total of 10.35 acres was re-seeded with a seed drill. An additional 1.45 acres of steep slopes were hydro-seeded and then covered with erosion-control mats.

Meetings with NMED personnel in December 1999 and February 2000 determined that only the friable-asbestos cleanup area warranted confirmatory soil samples. The soil samples were collected in April 2000.

Future Work Planned

No future work is planned for ER Site 228A or 228B. The NFA Proposal for SWMU 228A was accepted by NMED in March 2000. NMED approved the the Class 3 Permit Modification for ER Site 228A on September 15, 2000. The NFA Proposal for SWMU 228B was accepted by NMED on March 30, 2001.

Waste Volume Estimated/Generated

Surface cleanup work has produced a total of approximately 20,740 cubic yards of waste and debris that were shipped from SWMU 228 to off-site, waste disposal facilities. No waste or debris presently remains at either SWMU 228A or SWMU 228B.

Approximately 136 cubic yards of soil and debris were removed from SWMU 228A. About 47 cubic yards of soil with approximately 605 pounds of DU fragments were categorized as Low Level Radioactive Waste. Eighty-eight cubic yards of concrete rubble, lumber, and scrap metal were taken to the KAFB Construction-Demolition Debris Landfill. Approximately one cubic yard of waste consisted of a variety of waste types such as hazardous, mixed, and asbestos. The hazardous waste consisted of about 300 pounds of electrical batteries. The mixed (radioactive constituents combined with RCRA metals) waste consisted of about 1,500 pounds of electrical components. About 1,000 pounds of non-friable asbestos were disposed of as Toxic Substance Control Act (TSCA) waste. About 60 pounds of lead plates were recycled.

Approximately 20,600 cubic yards of debris and waste were removed from SWMU 228B. Except for friable asbestos, all of the debris corresponded to the NMED category of construction-demolition debris. About 19,860 cubic yards of debris were hauled to the KAFB Construction-Demolition Debris Landfill. About 700 cubic yards of concrete rubble were supplied to KAFB for their use as rip-rap in erosion-control projects. About 30 cubic yards of friable-asbestos waste were shipped to a commercial TSCA waste-management facility. Approximately 500 pounds of iron and steel scrap were recycled.

Information for ER Site 228 was last updated Jan 15, 2003.